Breast self-examination: importance of technique in early diagnosis

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Shortly after diagnosis of breast cancer 416 patients were interviewed about their use of screening procedures and the method of tumour detection. Although 72% reported that they performed breast self-examination (BSE), only 12% actually inspected and palpated their breasts monthly. BSE was not significantly associated with tumour size or involvement of the lymph nodes; however, thorough inspection was associated with smaller tumours, and careful palpation with the absence of palpable nodes. Of those who no longer or never had examined their breasts 40% reported having annual breast examinations by their physician and had significantly smaller tumours than did the others. Most of the women (86%) reported having detected their own tumours, and BSE did not significantly increase the likelihood of self-detection. The frequency of use of screening procedures was similar in a sample of women without breast cancer.

Dans un bref délai après qu'on eut posé le diagnostic de cancer du sein, on a interrogé 416 patientes sur les méthodes de dépistage qu'elles avaient employées et la manière dont leurs tumeurs avaient été décelées. Si 72% d'entre elles disent avoir eu l'habitude d'examiner leurs seins, seules 12% pratiquaient réellement tous les mois l'examen visuel et la palpation. L'auto-examen en soi n'est en rapport significatif ni avec la grosseur de la tumeur ni avec l'envahissement ganglionnaire. Mais l'examen visuel minutieux est relié aux tumeurs plus petites, et la palpation soigneuse à l'absence de ganglions palpables. Parmi les femmes qui n'ont jamais examiné leurs seins ou qui ont cessé de le faire, les 40% qui se sont présentées chaque année chez le médecin pour l'examen des seins ont un volume tumoral moyen significativement plus petit que les autres. La plupart des femmes, soit 86%, disent avoir découvert la tumeur elles-mêmes; l'auto-examen n'améliore pas significativement ce pourcentage. Dans un échantillon de femmes non porteuses de cancer du sein, la fréquence d'emploi des moyens de dépistage est comparable.

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Breast carcinoma is the leading cause of death from cancer among women in Canada. Until a method of prevention is known, diagnosis and treatment must be carried out earlier to reduce mortality.

Previous studies have reported conflicting results on whether breast self-examination (BSE) leads to diagnosis at an earlier stage of breast cancer,[1-5] but few investigators have considered what was actually done during BSE.

We asked 416 women who had breast cancer about their prediagnostic levels of self-examination and routine medical examination in an effort to determine the relation between screening practices, tumour detection and the extent of disease at the time of diagnosis. BSE procedures that were associated with early diagnosis were identified, and information about screening practices among women without breast cancer was also solicited.

Methods

All women younger than 70 years who, according to the British Columbia cancer registry, had received a diagnosis of breast cancer between June 1980 and May 1982 were asked to complete a self-administered questionnaire about the etiology of the disease and their use of BSE. Responders to the questionnaire provided the names of neighbours and acquaintances, and from these names a sample of women without breast cancer, frequency matched for age, was obtained. This group of women was also asked to complete the questionnaire; 990 (79%) responded. More detailed information on screening practices was obtained by interview from the women with breast cancer who were attending the A. Maxwell Evans Clinic in Vancouver.

Of the 630 women eligible for interview only 416 were seen at the clinic by either of two trained interviewers: 195 did not complete the questionnaire in time to be interviewed and hence were not approached for interview, and 19 were approached but refused to be interviewed. The medical records of all eligible women were reviewed.

Statistical tests of significance (chi-square) were

carried out with continuity correction.[6] Multiple logistic regression was used to identify the components of BSE that were important for detecting the disease while tumours were small and before lymph nodes were palpable.[7] A separate analysis was carried out with tumour diameter (less than 2 cm, 2 cm or greater) and involvement of lymph nodes (yes, no) as dependent factors, with visual inspection of the breasts (thorough, glance, none), frequency of BSE (monthly, quarterly, less often), time taken examining breasts (1 minute or less, more than 1 minute) and palpation of breasts (yes, no) as independent variables. Age, marital status, family history of breast cancer, personal history of benign breast disease and routine medical examinations were included as possible confounding factors.

Results

Risk factors for breast cancer and the extent of disease among the patients who were interviewed differed little from those among patients who were eligible but not interviewed (Table I). Mean age at the time of diagnosis also differed little between the two groups (51.1 and 51.8 years respectively).

Screening practices for the women with breast cancer (ascertained by interviews) were similar to those among the women without breast cancer (ascertained from questionnaires) (Table II). We defined proper technique as monthly examination including inspection and palpation of the breast, nipple and axilla and found that 12% of the women with breast cancer and 9% of those without breast cancer used proper technique. A majority of the patients reported that they were confident in their knowledge about BSE (65%) and in their ability to detect an abnormality (79%). A similar level of confidence was found among the women without breast cancer.

The proportion of patients who had received instructions from a physician or nurse or at school was higher among those using proper technique (58%) than among those using improper technique (48%); however, this difference was not significant (p = 0.35). Mammographic screening was performed on too few women to be examined statistically.

Tumour detection

Most of the patients (86%) reported that their breast tumour was first detected by themselves (Table III). Although more of the women using correct technique found their tumour themselves, the difference between them and those using incorrect technique was not statistically significant (p = 0.43).

Extent of disease at time of diagnosis

There were no statistically significant associations between use of BSE and tumour size or presence of palpable lymph nodes, although the women using proper technique had smaller tumours and less involvement of lymph nodes than did those who either no longer or had never examined their own breasts (Table IV).

There was also an association of annual medical examination with smaller tumours, but it was statistically significant only for those who were not examining their own breasts (Table IV). Routine medical examination was not linked with the absence of palpable nodes.

The extent of disease at the time of diagnosis may be influenced by the length of delay from initial detection to diagnosis. To remove this potential bias an additional analysis was restricted to the 341 women for whom the delay was 3 months or less. The relation between screening practices and the extent of disease was not substantially affected by the restriction.

Table I—Risk factors for breast cancer among women interviewed about screening practices and women eligible but not interviewed

Factor	% of women	
	Interviewed (n = 416)	Eligible but not interviewed (n = 214)
Menarche at age ≤ 12 yr	34	30
Nulliparous	18	17
Sister or mother with breast cancer	12	15
Prior biopsy for benign breast disease	19	18
Clinically less advanced disease at time of diagnosis		
Tumour diameter < 2 cm	13	14
Nodes not palpable	75	80

Table II—Screening practices reported by 416 women with breast cancer and 990 women without breast cancer

Screening practice	Women (%)*	
	With breast cancer	Without breast cancer
Annual medical examination	57	51
Breast self-examination (BSE)	78 (325)	87 (863)
Current user	72	79
Ex-user	6	8
Frequency		
Monthly	54	49
After menstrual period†	29	34
Duration (min)		
≤ 1	33	10
2–3	44	40
≥ 4	22	36
Inspection	42	65
Correct posturing‡	41	52
Palpation		
Breast	77	92
Breast, nipple, axilla	35	–
Correct posturing‡	71	74

*Numbers in parenthesis are the total numbers of women who performed BSE at some time.
†Restricted to premenopausal women (women with breast cancer, n = 150; women without breast cancer, n = 296).
‡Restricted to women doing inspection (or palpation).

Specific components recommended for BSE were then related to tumour size and presence of palpable lymph nodes. Women thoroughly inspecting their breasts were twice as likely as others to have tumours smaller than 2 cm in diameter at the time of diagnosis ($p = 0.05$), and those not palpating their breasts were twice as likely to have lymph node involvement at the time of diagnosis ($p = 0.05$). For premenopausal women (119 with complete information) the timing of BSE in relation to menstruation was not associated with the extent of disease. Other factors that were not significant included the frequency and duration of each examination, correct posturing for inspection and palpation, and correct use of fingers during palpation.

Discussion

BSE has been widely recommended as a method of early detection of breast cancer; however, its efficacy has not been clearly demonstrated. Some investigators have found an association between less advanced breast cancer (i.e., small tumours and localized disease) and frequency of BSE;[1-3] others have not.[4,5] In our study monthly self-examination was not found to be statistically related to either less advanced disease at the time of diagnosis or increased likelihood of self-detection of the tumour.

Annual medical examination was associated with less advanced disease in our and other studies,[2,4] although in our study the relation was present only for women not using BSE. An apparent contradiction among the women receiving routine medical examinations was that those examining their own breasts had small tumours less often than did those not examining their breasts. This suggests that the relation found for annual medical examination should be interpreted with caution.

Most studies have been limited to frequency of use and have not considered the components of BSE. We investigated the use of recommended procedures and found that only about 10% of women monthly inspected and thoroughly palpated their breasts and axillae. Several other investigators have also reported a paucity of good technique among users. Assaf and colleagues[8] found that few women could detect lumps in a simulated breast model. Huguley and Brown[9] studied 2092 patients with breast cancer and concluded that only 57% of the women examining their breasts had satisfactory technique. Sheley[10] reported that only 24% of self-examiners were knowledgeable about correct timing and method.

We found that inspection was associated with small tumours at the time of diagnosis and that thorough palpation was associated with localized disease. Other recommended procedures had no bearing on diagnosis.

Table III—Relations between use of BSE and methods of tumour detection in women with breast cancer

	Tumour detection; no. (and %) of women					
	By self		By physician			
Use of BSE	Total	During BSE	Total	During routine medical examination	Other	Total
No longer or never	85 (82)	0 (0)	17 (16)	14 (14)	2 (2)	104
Currently	262 (87)	93 (31)	30 (10)	27 (9)	8 (3)	300
Proper technique	33 (92)	14 (39)	3 (8)	3 (8)	0 (0)	36
Improper technique	229 (87)	79 (30)	27 (10)	24 (9)	8 (3)	264
Total	347 (86)	93 (23)	47 (12)	41 (10)	10 (2)	404

Table IV—Relations between screening practices and extent of disease at time of diagnosis

	Extent of disease; no. (and %) of women					
	Tumour diameter			Palpable lymph nodes		
Use of BSE	< 2 cm	≥ 2 cm	p	No	Yes	p
Currently	39 (14)	249 (86)	0.99*	256 (85)	44 (15)	0.11*
Technique						
Proper	7 (21)	27 (79)	0.31	31 (86)	5 (14)	0.91
Improper	32 (13)	222 (87)		225 (85)	39 (15)	
Medical examination						
Annual	27 (15)	153 (85)	0.56	159 (84)	30 (16)	0.55
Less often or never	12 (11)	96 (89)		97 (87)	14 (13)	
No longer or never	14 (14)	84 (86)		81 (78)	23 (22)	
Medical examination						
Annual	10 (25)	30 (75)	0.03	35 (83)	7 (17)	0.39
Less often or never	4 (7)	54 (93)		46 (74)	16 (26)	

*As compared with no longer or never.

Haughey and associates[11] examined the detection skills of 126 nurses using breast models and noted that frequency and reported technique did not have a significant effect on such skills. Similarly, Assaf and colleagues[8] found no association with frequency, but the number of steps done correctly was positively related to the ability to detect lumps.

In spite of the lack of proper technique, most women reported that they were confident in their knowledge about BSE and their ability to detect an abnormality, a finding also noted by Celentano and Holtzman.[12]

There were several potential sources of bias in our study. Delay between first detection and diagnosis could have affected the extent of disease. However, the results did not change when the analysis was restricted to patients with 3 months' or less delay between detection and diagnosis. The large number of eligible women not approached for interview suggests the possibility of nonresponse bias. This could not be definitely determined; however, the extent of disease was similar in the responders and nonresponders. Also, no difference was found for factors related to the risk of breast cancer, which may influence the use of BSE. Recall bias about screening practices was possible because information was collected after the diagnosis of breast cancer; however, the frequency of screening practices was similar for the women with and without breast cancer. The similarity persisted in spite of the differences in data collection for the two groups. In a study examining recall bias Howe and Hoff[13] concluded that diagnosis of breast cancer did not bias reporting on BSE.

In conclusion, BSE as practised in this population did not greatly influence the extent of disease at the time of diagnosis. However, we cannot exclude a beneficial effect of BSE, as only about 1 in 10 of the women used proper technique. We found that breast inspection and careful palpation during BSE, and annual breast examination by medical personnel for women not examining their own breasts, were associated with less extensive disease. This finding suggests that properly executed breast examination may lead to early diagnosis. The complacency regarding personal knowledge about and skill in BSE implies that proper technique should be taught.

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